

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~striketrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please CANCEL claims 19, 30, and 34, and AMEND claims 1, 4, 8, 9, 13, 15, 16, 21, 27, 31-33, and 35-38 in accordance with the following:

1. (Currently Amended) An apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame, a pickup roller which picks up sheets of paper stacked on a paper cassette and transfers the paper into the printer, and a plurality of paper guides which are installed at a front portion of the paper cassette and guide the paper transferred by the pickup roller, the apparatus comprising:

a stripper which is installed to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette, and attached to at least one front side of each of the paper guides;

a lever which is installed at a side of the stripper and has a contact surface contacting the paper transferred by the pickup roller; and

a lever shaking unit which shakes the lever to intermittently contact a side of the paper transferred by the pickup roller, the lever shaking unit comprising

a lever shaft installed on the frame,

a shaking plate extending from the lever shaft, and

a shaker installed on the frame and intermittently contacting the shaking plate to shake the lever;

wherein a friction force is intermittently applied to the side of the paper such that double feeding of the paper is prevented.

2. (Original) The apparatus of claim 1, wherein the stripper comprises:

an opening groove formed on an upper portion of the stripper such that the contact surface of the lever contacts the side of the paper through the opening groove.

3. (Original) The apparatus of claim 2, wherein the lever is shaken so that the contact surface periodically at least three times contacts the paper while a front end of the paper

passes from a lower end of the contact surface to an upper end of the contact surface.

4. (Currently Amended) The apparatus of claim 1, wherein:
the stripper comprises, a plurality of sub-strippers; and
the lever comprises, a plurality of sub-levers having the same number as the sub-strippers.
5. (Original) The apparatus of claim 1, wherein the friction force intermittently applied to the side of the paper by the lever is larger than a resistance applied to the paper by the stripper.
6. (Original) The apparatus of claim 1, wherein the lever comprises:
a friction pad attached to the contact surface of the lever.
7. (Original) The apparatus of claim 6, wherein the friction pad is formed of a rubber material.
8. (Currently Amended) ~~The apparatus of claim 1, further comprising:~~ An apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame, a pickup roller which picks up sheets of paper stacked on a paper cassette and transfers the paper into the printer, and a plurality of paper guides which are installed at a front portion of the paper cassette and guide the paper transferred by the pickup roller, the apparatus comprising:
a stripper which is installed to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette, and attached to at least one front side of each of the paper guides;
a lever which is installed at a side of the stripper and has a contact surface contacting the paper transferred by the pickup roller;
a lever shaking unit which shakes the lever to intermittently contact a side of the paper transferred by the pickup roller; and
a lever shaft which is placed at the side of the stripper and rotatably installed on the frame of the printer, wherein the lever is fixed on the lever shaft, and the lever shaking unit shakes the lever shaft so that the lever is shaken,
wherein a friction force is intermittently applied to the side of the paper such that double feeding of the paper is prevented.

9. (Currently Amended) ~~The apparatus of claim 8, wherein~~ An apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame, a pickup roller which picks up sheets of paper stacked on a paper cassette and transfers the paper into the printer, and a plurality of paper guides which are installed at a front portion of the paper cassette and guide the paper transferred by the pickup roller, the apparatus comprising:

a stripper which is installed to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette, and attached to at least one front side of each of the paper guides;

a lever which is installed at a side of the stripper and has a contact surface contacting the paper transferred by the pickup roller;

a lever shaking unit which shakes the lever to intermittently contact a side of the paper transferred by the pickup roller; and

a lever shaft which is placed at the side of the stripper and rotatably installed on the frame of the printer, wherein the lever is fixed on the lever shaft, and the lever shaking unit shakes the lever shaft so that the lever is shaken,

wherein a friction force is intermittently applied to the side of the paper such that double feeding of the paper is prevented, and

the lever shaking unit comprises:

a shaking plate fixed on the lever shaft;

a cam gear which contacts a first side of the shaking plate, rotates, and periodically shakes the shaking plate so that the lever coupled with the lever shaft is shaken;

an elastic member which is installed at a second side of the shaking plate and applies an elastic force to the shaking plate so that the shaking plate is closely attached to the cam gear; and

a driving motor which rotates and drives the cam gear.

10. (Original) The apparatus of claim 9, wherein the driving motor rotates and drives the pickup roller.

11. (Original) The apparatus of claim 9, wherein the elastic member comprises: a compression coil spring.

12. (Original) The apparatus of claim 9, wherein the elastic member comprises:

a leaf spring.

13. (Currently Amended) The apparatus of claim 9, wherein:
the cam gear comprises; a cam surface; and
the lever shaking unit comprises; at least one cam protrusion formed on the cam surface
that contacts the shaking plate.

14. (Original) The apparatus of claim 13, wherein the at least one cam protrusion
comprises:
three sub-cam protrusions formed at the same intervals along a circumference of the
cam surface that contacts the shaking plate.

15. (Currently Amended) ~~The apparatus of claim 8, wherein~~ An apparatus for
preventing paper double feeding in a paper feeding unit of a printer having a frame, a pickup
roller which picks up sheets of paper stacked on a paper cassette and transfers the paper into
the printer, and a plurality of paper guides which are installed at a front portion of the paper
cassette and guide the paper transferred by the pickup roller, the apparatus comprising:
a stripper which is installed to be inclined at a predetermined angle with respect to the
paper stacked on the paper cassette, and attached to at least one front side of each of the paper
guides;
a lever which is installed at a side of the stripper and has a contact surface contacting the
paper transferred by the pickup roller;
a lever shaking unit which shakes the lever to intermittently contact a side of the paper
transferred by the pickup roller; and
a lever shaft which is placed at the side of the stripper and rotatably installed on the
frame of the printer, wherein the lever is fixed on the lever shaft, and the lever shaking unit
shakes the lever shaft so that the lever is shaken,
wherein a friction force is intermittently applied to the side of the paper such that double
feeding of the paper is prevented, and
the lever shaking unit comprises:
a shaking plate fixed on the lever shaft; and
a solenoid which is coupled with the shaking plate and periodically shakes the
shaking plate so that the lever coupled with the lever shaft is shaken.

16. (Currently Amended) A method of preventing paper double feeding in a paper feeding unit of a printer when sheets of paper stacked on a paper cassette are picked-up and transferred into the printer, the method comprising:

applying a first paper feeding resistance force to a first sheet of paper which is picked-up by a pickup roller and transferred along a paper path into the printer; and

intermittently applying a second paper feeding resistance force to a side of one of the first sheet of paper and a second sheet of paper disposed under the first sheet of paper,

wherein the second paper feeding resistance force includes a friction force intermittently applied to the side of the second sheet of paper by a lever which is installed to be shaken on the paper path.

17. (Original) The method of claim 16, wherein the applying of the first paper feeding resistance force comprises:

applying a resistance generated by a stripper which is installed to be inclined at a predetermined angle on the paper path.

18. (Original) The method of claim 16, wherein the first paper feeding resistance force is smaller than a first paper feeding force applied to the first sheet of paper by the pickup roller and is larger than a paper feeding force applied to the second sheet of paper due to a friction force between the first and second sheets of paper.

19. (Cancelled)

20. (Original) The method of claim 16, wherein the second paper feeding resistance force is larger than the first paper feeding resistance force.

21. (Currently Amended) An apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame, a pickup roller which picks up paper stacked on a paper cassette and transfers the paper into the printer, and a plurality of paper guides which are installed at a portion of the paper cassette and guide the paper transferred by the pickup roller in a paper feeding path, the apparatus comprising:

a stripper disposed on the paper feeding path, fixedly installed on the frame to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette, and contacting the paper transferred by the pickup roller to apply a first paper feeding resistance

force to the paper;

a lever shaking unit, comprising

a shaft movably installed on the frame,

a plate extending from the lever shaft, and

a motor, selectively contacting the plate to rotate the lever shaft; and

a lever disposed on the paper feeding path, installed on the shaft~~movably installed on the frame~~, and having a contact surface selectively contacting the paper transferred by the pickup roller to apply a second paper feeding resistance force to the paper in correspondence with the shaft rotation.

22. (Original) The apparatus of claim 21, wherein the paper comprises a first paper and a second paper, and the stripper applies the first paper feeding resistance force to the first paper while the contacting surface of the lever applies the second paper feeding resistance force to the second paper.

23. (Original) The apparatus of claim 21, wherein the lever selectively contacts the paper while the stripper contacts the paper.

24. (Original) The apparatus of claim 21, wherein the lever intermittently applies the second paper feeding resistance force to the paper.

25. (Original) The apparatus of claim 21, wherein the lever moves in a direction between a first position to allow the contact surface to contact the paper and a second position to allow the contact surface to be moved away from the paper passing the stripper.

26. (Original) The apparatus of claim 21, wherein the lever rotates in a direction perpendicular to the paper feeding direction.

27. (Currently Amended) The apparatus of claim 21, wherein the stripper comprises another contact surface contacting the paper and an opening formed ~~on~~ through the another contact surface, and the contact surface of the lever is disposed on the opening of the another contact surface of the stripper.

28. (Original) The apparatus of claim 27, wherein the contact surface of the lever

contacts the paper through the opening.

29. (Original) The apparatus of claim 21, wherein the paper comprises a first paper and a second paper, the first paper and the second paper generate a friction force between the first paper and the second paper, and the second paper feeding resistance force is equal to or greater than the friction force.

30. (Cancelled)

31. (Currently Amended) The apparatus of claim ~~30~~21, wherein the lever shaking unit further comprises:

a resilient member biasing the lever in a first direction; ~~and~~

~~a motor moving the lever in a second direction to selectively allow the contact surface to contact the paper.~~

32. (Currently Amended) ~~The apparatus of claim 31~~An apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame, a pickup roller which picks up paper stacked on a paper cassette and transfers the paper into the printer, and a plurality of paper guides which are installed at a portion of the paper cassette and guide the paper transferred by the pickup roller in a paper feeding path, the apparatus comprising:

a stripper disposed on the paper feeding path, fixedly installed on the frame to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette, and contacting the paper transferred by the pickup roller to apply a first paper feeding resistance force to the paper;

a lever disposed on the paper feeding path, movably installed on the frame, and having a contact surface contacting the paper transferred by the pickup roller to apply a second paper feeding resistance force to the paper; and

a lever shaking unit mounted on the frame to shake the lever to intermittently contact the paper transferred by the pickup roller,

wherein the lever shaking unit comprises:

a resilient member biasing the lever in a first direction,

a motor moving the lever in a second direction to selectively allow the contact surface to contact the paper,

a shaft connected to the lever;

a shaking plate connected to the shaft; and
a cam connected to the motor to contact the shaking plate.

33. (Currently Amended) The apparatus of claim 31, wherein the shaft is parallel to a width direction of the paper perpendicular to the paper feeding direction, ~~and the lever rotates with respect to the shaft.~~

34. (Cancelled)

35. (Currently Amended) ~~The apparatus of claim 21, further comprising:~~ An apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame, a pickup roller which picks up paper stacked on a paper cassette and transfers the paper into the printer, and a plurality of paper guides which are installed at a portion of the paper cassette and guide the paper transferred by the pickup roller in a paper feeding path, the apparatus comprising:

a stripper disposed on the paper feeding path, fixedly installed on the frame to be inclined at a predetermined angle with respect to the paper stacked on the paper cassette, and contacting the paper transferred by the pickup roller to apply a first paper feeding resistance force to the paper;

a lever disposed on the paper feeding path, movably installed on the frame, and having a contact surface contacting the paper transferred by the pickup roller to apply a second paper feeding resistance force to the paper; and

a single motor rotating the pickup roller and moving the lever with respect to the stripper.

36. (Currently Amended) An apparatus for preventing paper double feeding in a paper feeding unit of a printer having a frame, a pickup roller which picks up paper stacked on a paper cassette and transfers the paper into the printer, and a plurality of paper guides which are installed at a portion of the paper cassette and guide the paper transferred by the pickup roller in a paper feeding path, the apparatus comprising:

a stripper fixedly disposed on the paper feeding path to apply a first paper feeding resistance force to the paper fed by the pickup roller;

a lever movably disposed on the paper feeding path to selectively apply a second paper feeding resistance force to the paper fed by the pickup roller, the lever being installed on a lever shaft rotatably installed on the frame;

a plate extending from the lever shaft; and
a power source controlling the lever, by intermittently contacting the plate, to selectively move with respect to the paper fed by the pickup roller to contact the paper.

37. (Currently Amended) An apparatus for picking up sheets of paper in a printer, comprising:

a pickup roller installed in the printer;
an intermittent force applying unit, comprising
a shaft installed on the printer,
a plate extending from the shaft, and
a contactor installed on the printer and intermittently contacting the plate to rotate the shaft; and
a lever installed on the shaft and intermittently applying a friction force, under influence of the intermittent force applying unit, to a rear side of the picked-up sheet of paper picked up by the pickup roller, to prevent the paper from not being picked-up, and prevent double feeding of the paper.

38. (Currently Amended) A method of picking up sheets of paper in a printer, the method comprising:

intermittently applying a friction force, via a force applying unit, to a rear side of the picked-up sheet of paper picked up by a pickup roller installed in the printer, to prevent the paper from not being picked-up, and prevent double feeding of the paper, wherein the force applying unit comprises
a shaft installed on the printer,
a plate extending from the shaft
a contactor installed on the printer and intermittently contacting the plate to rotate the shaft, and
a lever rotating with the shaft to intermittently apply the friction force.